Framework for Analisis and Improvement of Agrarian Dynamics

Bachev, Hrabrin

Institute of Agricultural Economics, Sofia, Bulgaria

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Hrabrin BACHEV[1]
Institute of Agricultural Economics, Sofia, Bulgaria

Abstract. In this paper we incorporate interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, Behavioral and Political Sciences), and suggest a framework for analyzing and improvement of governance of socio-economics dynamic of agriculture. This new approach take into account: the role of specific institutional environment (formal and informal "rules of the game", distribution of various rights between individuals, and systems of enforcement of rights and rules; behavioral characteristics of agents (preferences, bounded rationality, tendency for opportunism, risk aversion, trust); costs of governance and critical factors of transactions (uncertainty, frequency, asset specificity, and appropriability); comparative efficiency of market, private, public and hybrid modes of governance; efficiency of alternative modes for public intervention; complementarities between different modes; needs for multilateral and multilevel governance; technological and ecological factors.

Keywords. governance of socio-economic dynamics and sustainable development; market, private, public and hybrid modes of governance; agrarian development

Introduction

The problem of effective governance of socio-economic dynamics of agriculture is among the most topical issues in academic, business, and policies debates in developed, transitional, and developing countries [1, 2, 3, 4, 5, 6]. Different societies achieve to a different extend the economic, social, environmental, intra and inter-generational goals of agrarian development, and that depends on a great variety of political, economical, natural, technological, international etc. factors. It is increasingly recognized that specific governing structure, responsible for a particular (social) order in each country and community plays a crucial role. It affects in dissimilar ways individuals behavior, gives unlike incentives to use natural, technological and market opportunities, command different costs, and lead to diverse actual performances.

Despite that "the institutional aspect" is largely ignored and a "normative" approach dominates while the costs of governance (known as transitions costs) are not included into analyses. Consequently, potential of market and private governing modes for the specific economic, institutional and natural environment in each country, region, sub-sector and eco-system can not be properly assessed. Nor effective modes for public (government, EU, international assistance) interventions in agrarian sphere designed.

[1] Corresponding Author. Institute of Agricultural Economics, 125 Tzarigradsko shosse Blvd. Block 1, 1113 Sofia, Bulgaria; E-mail: hbachev@yahoo.com.

In this paper we incorporate interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, Behavioral and Political Sciences), and suggest a holistic framework for analyzing and improvement of governance of socio-economics dynamics of agriculture. This new approach takes into account: the role of specific institutional environment; behavioral characteristics of individual agents; transaction costs associated with various forms of governance; critical factors of agrarian activity and exchanges; comparative efficiency of market, private, public and hybrid modes; efficiency of alternative modes for public intervention; complementarities between different modes; needs for multilateral and multilevel governance; technological and ecological factors.

1. Governance matters

1.1. Failure of the traditional framework

The division and specialization of labor, and related exchange and cooperation, open up enormous opportunities for increasing productivity and socio-economic dynamic in agriculture[2]. It let producing additional value (better resource management, bigger output, maximum economies of scale and scope) and creates incentives for deepening individual's specialization and exchanges. Furthermore, it leads to division of traditional agrarian activity and development of huge new sectors of economy such as: agrarian research and innovation, agrarian inputs production, agricultural services, proper farming, processing of farm products, marketing of farm and food products, agrarian crediting, agrarian insurance etc.

Specialization and exchange also increase (inter)dependency between individuals (demand, opportunistic behavior, monopoly situation) replacing or minimizing traditional "dependence from nature". What is more, nowadays this dependency is no anymore restricted to sectoral and national borders. For example, the level of agrarian sustainability in certain countries or regions of South America, Africa and Asia is heavily dependent on development of biotechnology, state of the economy, funding or demand for specific (low-cost, origins, organic, fair-trade) products in North America and Europe.

In the traditional (Neoclassical Economics) framework there is only one mechanism for governing the overall economic activity. Free market prices and market competition effectively coordinate and stimulate relations and activities of resource owners, producers and consumers. Individuals adapt to price movements and new (technological, production, consumption) opportunities, and trade available resources (and products) in mutual benefit until exhausting the possibilities for increasing productivity (social output), maximizing consumption and welfare, and achieving sustainable development[3]. Socio-economic dynamics and maximum efficiency (known as Pareto optimum) is reached through the governance of "invisible hand of market".

[2] Economic advantages from division, specialization and cooperation of labor at national and international scale have been among the fundaments of the Political Economy for more than 200 years.

[3] Currently, there is a principle agreement (a " social contract") for a global sustainable development.

Nevertheless, there are recognized a number of cases of "market failure" which interrupt sustainable agrarian development. Major instances of market deficiencies are associated with:

- "negative and positive externalities" [7] - free-market prices do not always reflect the effect on third party's welfare, and an elimination of the differences between the "social" and "private" prices ("internalization of externalities") through public taxes, norms etc. is suggested;
- "tragedy of commons" [8] - in a situation of multiple users and open access to natural resources, there are strong individual interests for overusing (ultimately destroying) common resources since private costs are not proportionate to private benefits. Therefore, strict management of common goods through government regulation is suggested;
- multi-functionality or joint production character of agriculture [2] – besides "private goods" agriculture produce "public goods" (rural amenities, ecological and cultural services, habitat for wildlife, biodiversity) and "public bads" (wastes, pollution). Much of the "non-commodity" output is "not-separable" from the major farming activities. For these public goods and bads no markets exist or function very poorly, and farmers need special incentives (public contract) to produce them in a socially demanded scale.

Thus the needs for public governance (regulation, funding, tax) are acknowledged. What is more, it has been demonstrated there are a great number of non-market (private and collective) modes which deal effectively with above problems – voluntary initiatives, codes of behavior, contractual arrangements, cooperatives etc. [9, 10].

Coase discovered one more important aspect of market failure caused by the fact that "there are costs of using the price mechanism" [11]. Very often the high transaction costs of outside exchange (finding best prices and partners, negotiating conditions of exchange, protecting from opportunistic behavior and risks) makes it more profitable to carry out division and cooperation of labor within an organization (firm, group farm) instead across the market. Likewise, the internal management of transactions is also associated with costs (for directing, stimulating and supervising hired labor; coordination and controlling activity of partners) which restricts unlimited expansion of borders of an organization. Thus a transaction will be carried in an organization if the costs are lower than for governing that transaction across market or in another organization. Consequently, the distribution of overall (agrarian) activities between different farms, organizations, and markets will be determined by the comparative costs for using various governing arrangements as the most efficient one(s) (minimizing internal and external transaction costs) will tend to prevail [12].

Coase also proved that the problem of "social costs" does not exist in a world of zero transaction costs and well-defined private rights [13]. Situation of maximum efficiency is always achieved through private contracts between individuals independent of the initial allocation of rights (and any needs for public intervention). However, when transaction costs are significant, then costless negotiation and exchange of rights is not possible. Therefore, the initial allocation of property rights between individuals is critical for the overall efficiency and sustainability[4].

[4] E.g. when rights on critical resources (activities) are not hold by the most efficient user that could significantly impede development - conflicts between landlords and tenant-farmers, unproductive monopolies.

What is more, when important rights are not well-defined (e.g. rights on clean air and water; intellectual properties etc.) that creates big difficulties in efficient use of resources and/or (mutually) beneficial exchange [5]. Consequently, some essential activities (and transactions) are not carried out at socially effective scale, and the existing governing structures less contribute to sustainable development [14]. North proved that the institutional structures for carrying out economic activities is an important factor, which eventually determine the outcome of the system and the type of the development [15].

If transaction costs were zero then mode of the governance would not be of economic importance [12]. In such a world individuals would manage their relations with equal efficiency though free market (prices movements), or through private organizations of different types (contracts, firms), or collective decision making (cooperative, association), or in a nationwide hierarchy (single private or state company). Then technological opportunities (economies of scale and scope, maximum productivity) and sustainable exploration of resources would be easily achieved. All information for the effective potential of transactions (optimization of resources, satisfying various demands, respecting assigned and transferred rights) would be costlessly available. And individuals would costlessly protect their (absolute and contracted) rights and trade available resources in mutual benefit exploring the overall potential for socio-economic growth.

However, in the real agrarian economy with positive transaction costs their high level could make difficult or even block otherwise efficient (mutually beneficial) for all parties transactions. For instance, despite the great pay-off of investments in agrarian research and innovation, market and private agents do not organize such activity because of their high uncertainty and low market and private appropriability [16]. Thus the type of governance become crucial since various modes give unequal possibilities for participants to realize entrepreneurial abilities, coordinate activities, stimulate acceptable behavior, protect rights and investments from unwanted expropriation and risks etc.

Therefore, assessing efficiency of governing mechanisms for socio-economic dynamics is essential for defining the potential and limits of market competition and private initiatives as well as for designing proper modes for public (Government, international etc.) interventions in agrarian sector [14].

Specific institutional environment in which activity takes place eventually determines the level of economic performance in different industries, regions, countries or periods of history. In the long-run, institutions are endogenous parameters and the institutional "development" is to be included in the model along with economic, social and environmental components of the system. Nevertheless, nirvana rather than comparative institutional approach is common in most framework of analysis of socio-economic dynamics[6]. Accordingly ideal norms rather than real-life and other feasible arrangements is used as criteria - e.g. farming model in other (e.g. developed, neighboring) countries, assumption for perfectly defined and enforced property rights, effectively working public (local, state, inter-governmental) organizations etc.

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[5] e.g. unsolvable costly disputes between polluting farmers and neighborhood; slow transfer and dissemination of agrarian innovations etc.

[6] "those who adopt the nirvana viewpoint seek to discover discrepancies between the ideal and the real, and if discrepancies are found, they deduce that the real is inefficient. Users of the comparative institution approach attempt to asses which alternative real institutional arrangement seems best able to cope with the economic problem" [17].

1.2. The mechanisms of governance

In one person world there is no need for (any) governance since sustainable relations between the person and nature are achieved through a simple (production and/or consumption) management ("self-governance"). In the real world of limited resources, complex interactions between many individuals and conflicting interests, there is a need for effective governance (social order) to direct, coordinate, stimulate, induce and enforce agents efforts to accomplish a sustainable socio-economic development.

Principally, there are four distinct mechanisms of governance:

- *institutional environment* (or "rules of the game") – that is the distribution of de-facto rights and obligations between individuals, groups, communities and generations, and the system(s) of enforcement of these rights and rules[7]. They are constituted by formal laws, regulations, standards, court decisions or determined by tradition, culture, religion, ideology, ethical and moral norms. Enforcement of the various rights is done by state (administration, court, police) or other mechanisms such as community pressure, trust, reputation, private modes, self-enforcement etc. In the modern society a great deal of individuals activities and relations are regulated by some (general or specific) formal and informal rules. However, there is no perfect system of preset outside rules that can govern effectively the entire activities of individuals in all possible (and quite specific) circumstances of their life and relations.
- *market modes* – those are various decentralized initiatives governed by free market price movements and market competition (spotlight exchanges, classical contracts, production and trade of organic products and origins, system of fair-trade etc.). Importance of the "invisible hand" of market for effective coordination and stimulation of individuals activities has been one of the fundamentals of modern economy (and policies for development and globalization). However, there has also been a great number of "market failures" compromising sustainable development and leading to social crisis, economic crisis, ecological crisis, energy crisis etc.
- *private modes* ("private or collective order") – those are diverse private initiatives, and specially designed contractual and organizational arrangements governing bilateral or multilateral relationships between private agents (voluntary individual or collective actions, codes of professional behavior, environmental contracts and cooperatives etc.). There has been emerging a great number of private and collective forms managed by the "visible hand of manager", collective decision-making, private negotiations etc. governing successfully various aspects (and challenges) of socio-economic development. Nevertheless, there are also many examples of "private sector failures" (lack of potential to coordinate and stimulate sustainability) demonstrating incapability to deal effectively with problems of development.
- *public modes* ("public order") – these are various forms of a third-party public (Government, community, international) intervention in market and private sectors such as public guidance, public regulation, taxation, public assistance,

[7] Spectrum of rights could embrace material assets, natural resources, intangibles, certain activities, labor safety, clean environment, food security, intra- and inter-generational justice etc.

public funding, public provision etc. The role of public (local, national and transnational) governance has been increasing along with intensification of activity and exchange, and growing interdependence of social, economic and environmental activities (and related problems and risks). In many cases, the effective organization of certain activity through market competition and/or private negotiation would take a long time, be very costly, could not reach socially desirable scale, or be impossible. Thus a centralized public intervention could achieve the willing state of the system faster, cheaper or more efficiently. Nonetheless, there are a great number of bad public involvements (inaction, wrong intervention, over-regulation) leading to significant problems of sustainable development around the globe.

- *hybrid forms* – some mixture combining features of market and/or private and/or public governance (e.g. state certifies organic producers and enforces organic standards, and thus intensifies development of organic markets and environmental sustainability).

Specific institutional environment is the *key parameter* eventually responsible for the outcome of socio-economic development [15]. It affects human behavior and directs (governs) individuals' activities "in a predictable way" creating dissimilar incentives, restrictions and costs for intensifying exchange, increasing productivity, inducing private and collective initiatives, developing new rights, decreasing divergence between social groups and regions, responding to ecological and other challenges. For example, (socially) acceptable norms for use of labor (employment of children, safety standards, minimum wages), plant and livestock (animal welfare, preservation of biodiversity, usage of GM crops), and environmental resources (water use rights; permissions for pollution), all they could differ even between various regions of the same country.

The *institutional "development"* is initiated by public authority, international actions (agreements, assistance, pressure), and private and collective actions of individuals[8]. It is associated with modernization and/or redistribution of existing rights; and evolution of new rights and emergence of novel (private, public, hybrid) institutions for their enforcement. For instance, sustainability initially evolved as "movements" and a "new ideology" in developed countries. Afterward this "new concept" extended and instituted in the body of formal laws, regulations and public support programs. Numerous decentralized initiatives of producers and consumers have been wide-spreading (codes of ethical behavior, organic farming, system of fair-trade) being important part of (pushing up) institutional modernization in the area.

Diverse *institutional environment* contributes to a different extend to achieving economic, social, environmental etc. goals of development. For instance, private rights on major agrarian resources were not well-defined during post-communist transition in Bulgaria. That led to domination of low productive, unsustainable and "gray" structures; sharp decline in major productions and ineffective use of national resources; and serious socio-economic and environmental problems [18].

"Rational" agents pursue their goals and benefit from the specialization and available resources using diverse modes of governance – compete and/or cooperate with each others, and/or exchange rights and resources, and/or obey to an external private, collective or public order. Depending on efficiency of the system of

[8] Factors for emergence and evolution of various types of institutions are quite specific for each society (community), and require a multidisciplinary analysis and explanation [15].

governance which is put in place, the outcome of development is quite different with diverse levels of socio-economic progression (Figure 1). Now it is widely recognized that enormous world potential for increasing food production is not effectively used because of the bad governance which slow-down scientific and technological progress, impede development of markets and private organizations, allow particular groups to benefits from status-quos, and lead to constant food crisis and unsustainable "development".

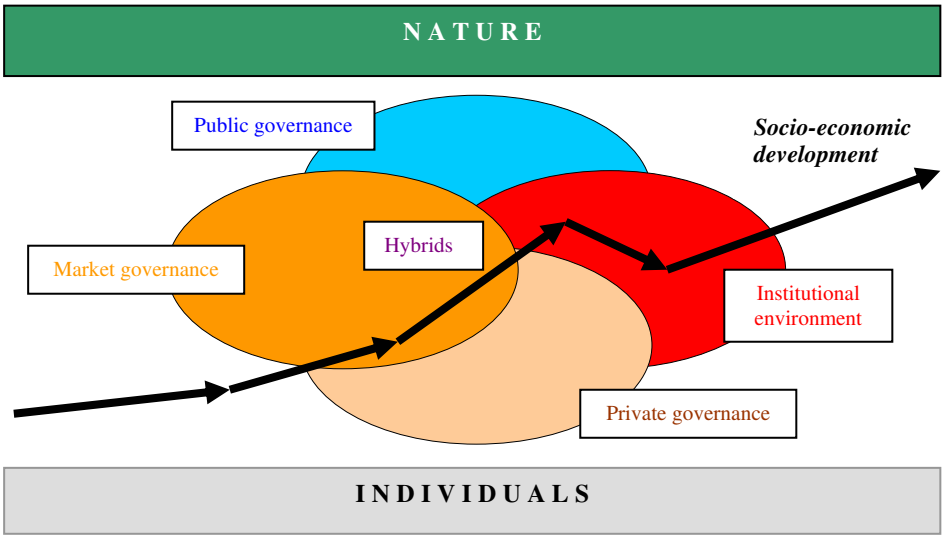

Figure 1. Governing mechanisms for socio-economic dynamics of agriculture.

1.3. The costs of governance

Transaction costs are the costs associated with the protection and exchange of individuals' rights [19]. In addition to production costs, economic agents make significant costs for governing of their relations with other agents (individuals, private entities, public authorities). For example, farmers have costs for finding best prices and partners for land, inputs and labor supply, financing, marketing of outputs; negotiating conditions of exchange; completing (writing down) contract or setting up a partnership organization; coordination through a collective decision-making or direct managerial orders; enforcing negotiated terms through monitoring, controlling, measuring, safeguarding; disputing through a court system or another way; adjusting or termination along with changing market, institutional, and natural environment.

Institutional environment considerably affects the level of transaction costs. For instance, when private rights are well defined and protected, and (public) system for contract enforcement work well - that facilitates transactions between individuals and effective allocation of resources. (Development of) institutional environment also imposes significant (transaction) costs to agents – e.g. for studying out and complying with various institutional restrictions (community or state norms, regulations, standards), formal registration of contracts and entities, efforts to deal with bureaucracy etc. A good example in this respect are current problems of many Bulgarian farms to

meet new EU standards (“institutionally determined” costs) related to product quality, food safety, labor conditions, eco-protection, animal welfare etc. [20].

Transaction costs have two *behavioral* origins: individual’s bounded rationality and tendency for opportunism [12]. Economic agents do not possess full information about the system (price ranges, trade opportunities, adverse effects of their activities on others, trends in development) since collection and processing of such information would be either very expensive or impossible[9]. In order to optimize decision-making (to reach the state of efficiency) they have to spent costs for "increasing their imperfect rationality" – for data collection, analysis, forecasting, training etc.

Individuals are also given to opportunism and if there is opportunity for some agent to get non-punishably extra rent from exchange (performing unwanted exchange) he will likely “steal” others rights. Two major forms of opportunism can be distinguished: pre-contractual ("adverse selection") - when some partner uses the "information asymmetry" to negotiate better contract terms; and post-contractual ("moral hazard") - when some counterpart takes advantage of impossibility for full observation on his activities (by another partner or a third party) or when he takes "legal advantages" of unpredicted changes in transacting conditions (costs, prices, weather). A third form of opportunism occurs in development of large organizations (known as “free-riding”). Since individual benefits are often not proportional to individual efforts, everybody tends to expect others to invest costs for organizational development and later on to benefit from the successful new organization [21].

Commonly, it is very costly or impossible to distinguish opportunistic from non-opportunistic behavior (because of bounded rationality). Therefore, agrarian agents have to safeguard their transactions and rights from the hazard of opportunism through: ex ante efforts to protect their “absolute” (given by dominating institutions) rights, and find a reliable counterpart and design efficient mode for partners credible commitments to “contracted” (voluntary transferred) rights; and ex post investments for overcoming possible opportunism (through monitoring, controlling, stimulating cooperation) during contract execution stage.

Technological development also affects enormously structure and level of transaction costs [15]. Mechanization and standardization of farming operations and products increases bounded rationality of manager, and diminishes possibility for opportunism of hired labor and counterparts. That leads to extension of activities and transactions under a singe management (farm size) – enlargement of internal transactions (internal division and specialization of labor) and outside market and contract transacting (procurement, trade, cooperation). Possibilities that application of modern production (e.g. precision farming), transportation, measurement, information, communication technologies gives to coordinate and intensify transactions and minimize related costs are immense - easy assessment and traceability; on line information, coordination, monitoring, detecting, advise; direct low costs exchanges (expressing demands, finding best prices and partners, negotiating, trading, disputing) and collective actions (coalition) of interested agents at national and international scales; rapid detection of problems and intervention by governments and international agencies; full participation of individuals in and control on public decision-making etc.

There is not a singe (universal) mode for effective organization of all type of agrarian activity in any possible natural, institutional, and economic surroundings [22].

[9] e.g. for future events, for partners intention for cheating, time and space discrepancy between individual action and adverse impacts on others etc.

Individual governing forms have *distinct features* (different advantages and disadvantages) to protect rights and coordinate and stimulate socially desirable activities. Besides, agents have specific *personal characteristics* – different awareness, entrepreneurships, preferences, risk aversion, tendency for opportunisms etc. Furthermore, efficiency of governing mode will depends on the *specific attributes* of each activity and transaction. Therefore, individual transaction and transaction costs are to be put in the *centre of analysis*, and comparative efficiency of feasible modes for governing of socially desirable activities assessed [14].

2. Improving the governance

2.1. Factors of governance choice

In rare cases there is *only one* practically possible form of governance of agrarian activity. For example, in Japanese dispersed paddy agriculture water supply could not have been conducted by individual farmers (high interdependency, nonseparability of water use) and since earliest period water use organization developed as public projects [23].

Often the choice of governing mode is pre-determined by institutional restrictions as some forms for carrying out farming activities, land and labor supply, trade of output etc. could be socially unacceptable or illegal in certain countries or period of time[10]. For instance, corporate and cooperative organization of farming is forbidden in many countries; market trade of farmland and some outputs (inputs) is illegitimate, private management of national ecosystems (parks, reserve zones) is not allowed etc.

Generally, every agrarian activity and transaction could be governed through a great variety of *alterative* forms. For instance, a supply of environmental preservation service could be governed as: voluntary activity of a farmer; though private contracts of the farmer with interested or affected agents; though interlinked contract between the farmer and a supplier or processor; though cooperation (collective action) with other farmers and stakeholders; though (free) market or assisted by a third-party (certifying and controlling agent) trade with special eco, protected origins or fair-trade products; though a public contract specifying farmer's obligations and compensation; though a public order (regulation, taxation, quota for use of recourses or emissions); within a hierarchical public agency or by a hybrid form.

Individual governance modes have distinct *advantages* and *disadvantages* to protect individuals rights, and coordinate and stimulate socially desirable activities.

Free market has a big coordination and incentive advantages ("invisible hand of market", "power of competition"), and provides "unlimited" opportunities to benefit from specialization and exchange. However, market governance could be associated with high uncertainty, risk, and costs due to price instability, great possibility for facing opportunistic behavior, "missing market" situation etc.

Special contract form ("private ordering") permits better coordination, intensification, and safeguarding transactions. However, it may require large costs for

[10] Nevertheless, when transaction costs associated with illegitimate governance is not high (possibility for disclosure low, enforcement and punishment insignificant) while benefits are considerable, then more effective modes prevail – large gray or black sectors of economy are common around the globe.

specification of contract provisions, adjustments with constant changes in conditions, enforcement and disputing of negotiated terms etc.

Internal (ownership) organization allows a greater flexibility and control on transactions (direct coordination, adaptation, enforcement, and dispute resolution by a fiat). However, extension of internal mode beyond family and small-partnership boundaries (allowing minimum technological or agronomic requirements; exploration of technological economies of scale and scope) may command significant costs for development (initiation and design, formal registration, restructuring), and current management (collective decision making, control on coalition members opportunism, supervision and motivation of hired labor etc.).

Separation of ownership from management (cooperative, corporation, public firm/farm) gives enormous opportunities for growth in productivity and transacting efficiency – internal division and specialization of labor; exploration of economies of scale and scope; introduction of innovation; diversification; risk sharing; investing in product promotion, brand names, relations with customers, counterparts and authorities. However, it could be connected with huge transaction costs for decreasing information asymmetry between management and shareholders, decision-making, controlling opportunism, and adaptation. *Cooperative and non-for profit form* also suffers from low capability for internal long-term investment due to non-for-profit goals and non-tradable character of shares (so called "horizon problem").

In order to select the best (most efficient) form for governing of a particular activity we have to assess the comparative advantages and disadvantages of practically possible forms for governance of that activity.

In some cases advantages of a certain mode of governance are not difficult to verify - e.g. when it gives bigger benefits (achieves socially desirable/effective scale) or commands minimum total costs. In such cases the choice of most effective form is easy since we can compare directly the costs and benefits of alternatives. For instance, much of agrarian activity is commonly governed in family farms, supply of inputs or exchange of farm output are governed my market modes etc.

In many instances, direct assessment (comparison) of costs and benefits of alternative governing arrangements are difficult or impossible to make. That is particularly true for some elements of transaction costs related to divers governance structures. In the later group we can include the costs for finding best partners, negotiation, controlling and enforcement contractual terms, organizational development, interlinked transacting, unrealized (failed) deals etc. [22]. Besides, it is often extremely complicated to separate transaction costs from traditional production expenditures[11]. For example, while executing farming operations a farmer supervises hired labor; during transportation of chemicals he negotiates marketing of output etc.

What is more, component comparison of transacting costs could not always give idea for organizational efficiency. Very often the alternative form decreases one type of costs while increasing another type costs – e.g. internalization of a transaction (replacement of market with integral mode) is associated with reduction of costs for information supply (overcoming market uncertainty), permanent (re)negotiations along with constantly changing conditions, safeguarding investments from outside opportunism. On the other hand, it enlarges costs for organizational formation, decision making, integral management, supervising and motivation of hired labor etc. Thus, it is

[11] All these *"measurement problems"* make it impossible to extend the traditional Neoclassical models simply by adding a new "transacting activity" [19].

important to take into consideration the overall (total) costs for organization of transactions of different types - all external and internal costs of governance.

Often it is difficult to select a base for comparison in view that the high transacting costs entirely block development of alternative organization. For instance, market for agrarian credit did not emerged in Bulgaria during most of the transition and internal supply (utilization of own finance, direct outside co-investment) was the only possible form for finance supply of farms [18]. Here comparative level of transaction costs is impossible to be determined and appreciate the "high" efficiency of the integral mode for finance supply. In that case funding with "own means" and with "bank credit" are not alternative at all but completely different governing structures.

Discrete structural analysis is suggested to evaluate comparative efficiency of alternative governing forms [12]. This approach aims to evaluate relative (rather than absolute) levels of transacting costs between alternative governance modes, and select that one which most economize on transacting costs. Following that framework we have to identify the "critical dimensions" of transactions responsible for the variation of transaction costs. "Frequency", "uncertainty", and "asset specificity" have been identified as critical factors of transaction costs by Williamson [12] while "appropriability" has been added by Bachev and Labonne [16].

When *recurrence* of transactions between the same partners is high, then both (all) sides are interested in sustaining and minimizing costs of their relations (avoiding opportunism, building reputation, setting up adjustment mechanisms). Besides, costs for development of a special private mode for facilitating bilateral (multilateral) exchange could be effectively recovered by frequent exchange.

When *uncertainty*, which surrounds transactions increases, then costs for carrying out and secure transactions go up (for overcoming information deficiency, safeguarding against risk). Certain risks could be diminished or eliminated by production management or through a special market mode (purchase of insurance). However, governance of most transacting risk would require special private forms – trade with origins; providing guarantees; using share-rent or output-based compensation; employing economic hostages; participating in risk-pooling, inputs-supply or marketing cooperative; complete integration [24].

Transaction costs get very high when *specific assets for relations with a particular partner* are to be deployed. Relation specific investments are "locked" in transactions with a particular buyer or seller, and cannot be recovered through "faceless" market trade. Therefore, dependant investment (assets) have to be safeguarded by a special form such as long-term contract, interlinks, hostage taking, joint investment, or ownership integration.

Transacting is particularly difficult when *appropriability* of rights on products, services or resources is low. "Natural" low appropriability has most of agrarian intellectual products - agro-market information, agro-meteorological forecasts, new varieties and technologies, software etc. Besides, all products and activities with significant (positive or negative) externalities are to be included in this group. If appropriability is low the possibility for unwanted (market or private) exchange is great, and the costs for protection of private rights (safeguard, detection of cheating, disputing) extremely high. Agents would either over produce (negative externalities) or under organize (positive externalities) such activity unless they are governed by efficient private or hybrid mode (cooperation, strategic alliances, long-term contract, trade secrets, or public order).

2.2. Principle governance matrix

Discrete structural analysis is performed by "aligning transactions (differing in their attributes) with the governance structures (differing in their costs and competence) in discriminating (mainly transaction cost economizing) way" [12]. According to the *combination* of specific characteristics of each transaction, there will be different the most effective form for governing of activity (Figure 2)[12].

Generic modes	**Critical dimensions of transactions**								
	Appropriability								
	High								Low
	Assets Specificity								
	Low				High				
	Uncertainty								
	Low		High		Low		High		
	Frequency								
	High	Low	High	Low	High	Low	High	Low	
Free market	⚘	⚘							
Special contract			⚘			⚘			
Internal organization					⚘		⚘		
Third-party involvement				✚				✚	
Public intervention									✚

⚘ - *the most effective mode*; ✚ - *necessity for a third party involvement*

Figure 2. Principle modes for governing of agrarian transactions.

Agrarian transactions with good appropriability, high certainty, and universal character of investments (partner can be changed anytime without significant additional costs) could be effectively carried across free market through spotlight or classical contracts. Organization of transactions with a special form or within farm (firm) would only bring extra costs without producing any transacting benefits.

Recurrent transactions with low assets specificity, and high uncertainty and appropriability, could be effectively governed through a special contract. Relational contract is applied when detailed terms of transacting are not known at outset (high uncertainty), and a framework (mutual expectations) rather than specification of obligations is practiced. Partners (self)restrict from opportunism and are motivated to settle emerging difficulties and continue relations (situation of a frequent bilateral trade). Besides, no significant risk is involved since investments could be easily (costlessly) redeployed to another use or users (no assets dependency exist).

A special contract forms is also efficient for rare transactions with low uncertainty, high specificity and appropriability. Dependent investment could be successfully safeguarded through contract provisions since it is easy to define and enforce relevant

[12] Differences in personal characteristics of agents are *disregarded*. Only *extreme levels* (high-low) of critical factors of transactions are considered. In the real agrarian economy there is a big *variation* of critical dimensions, and thus of effective governing forms (including mixed, hybrid, interlinked governance).

obligations of partners in all possible contingencies (no uncertainty surrounds transactions). The occasional character of transactions does not justify internalization within farm (firm).

Transactions with high frequency, big uncertainty, great assets specificity (dependency), and high appropriability, have to be organized within farm/firm (internal ownership mode). For instance, managerial and technological knowledge is quite specific to a farm, and its supply has to be always governed through a permanent labor contract and coupled with ownership rights [22]. Capital investments in land are to be made on owned (long-leased) rather than seasonally rented land (high site and product specificity). All "critical" to the farm material assets will be internally organized - production of forage for animals; important machineries; water supply for irrigated farming etc. While universal capital could be effectively financed by a market form (e.g. bank credit), highly specific investments can be only made through internal funding (own funds, equity sell, joint venture).

According to the personality of resource owners (capability, experience, preferences) and (transacting) costs of their coalition, different type of farm (agro-firm) will be efficient - one-person farm, family farm, partnership, cooperative farm, and corporative farms [22]. If specific and specialized capital cannot be effectively organized within the farm (economy of scale and scope explored, funding made), then effective governing form outside farm-gates is to be used - group farming, joint ownership, interlinks, cooperative, lobbying for a public intervention.

When strong assets (capacity, time of delivery, site, branding) inter-dependency with upstream or downstream partner exists, then it is not difficult to govern transactions through contract modes (strong mutual interests for cooperation and restriction of opportunism). For instance, effective eco-contracts between farmers and interested businesses (symmetrical dependency) are widely used in developed countries[13] leading to production methods (enhanced pasture management, reduce use of agrochemicals, wetland preservation) protecting water from pollution.

However, very often farmers face unilateral dependency and need effective (ownership) organization to protect their interests. Transacting costs for initiation and maintaining such "collective organization" is usually great (big number of coalition, different interests of members, "free-riding") and it is either unsustainable or does not evolve at all. That creates serious problems for efficiency (and sustainability) of individual farms - missing markets, monopoly or quasi-monopoly situation, impossibility to "induce" public intervention etc.

Enormous transacting difficulties arise when condition of assets specificity is combined with high uncertainty, low frequency, and good appropriability. Elaboration of special governing structure for private transacting is not justified, specific investments are not made, and activity (restriction of activity) fails to occur at effective scale ("market failure" and "contract failure"). Similar problems are encountered for rare transacting associated with high uncertainty and appropriability.

In all these cases, a third part (private agent, NGO, public authority) involvement in transactions is necessary (assistance, arbitration, regulation) in order to make them more efficient or possible at all. Emergence and unprecedented development of organic farming and system of fair-trade are good examples in that respect. There is increasing consumer's demand (price premium) for organic and fair-trade products in developed

[13] e.g. drinking water companies in Germany [25] and mineral water company Vittel in France [26].

countries. Nevertheless their supply could not be met unless effective *trilateral governance* (including independent certification and control) has been put in place.

When appropriability associated with a transaction is low, there is no pure market mode to protect and carry out activity effectively. Nevertheless, respecting others rights (unwanted exchange avoided) or *"granting out"* additional rights (needed transactions carried) could be governed by *"good will"* or *charity* actions of individuals, NGOs, government or international organizations. For instance, a great number of voluntary environmental initiatives (agreements) have emerged driven by competition in food industries, farmers' preferences for eco-production, and responds to public pressure for sound environmental management[14]. However, environmental standards are usually "process-based", and "environmental audit" is not conducted by independent party, which does not guarantee "performance outcome". Recent huge food safety, animal safety, and eco-scandals have demonstrated that such private schemes could often fail (high bounded rationality and possibility for opportunism).

In any case, voluntary initiatives could hardly satisfy the entire social demand especially if they require significant costs. Some private modes could be employed if a high frequency (pay-back on investment is possible) and a mutual assets dependency (thus incentive to cooperate) exists. In these instances, unwritten accords, interlinking, bilateral or collective agreements, close-membership cooperatives, codes of professional behavior, alliances, internal organization etc. are used. However, emerging of special (private) large-members organizations for dealing with low appropriability (and satisfying entire "social" demand) would be very slow and expensive, and they unlikely be sustainable in a long run ("free riding" problem). Therefore, there is a strong need for *a third-party public* (Government, local authority, international assistance) *intervention* in order to make such activity possible or more effective [22].

For example, supply of environmental goods by farmers could hardly be governed through private contracts with individual consumers because of low appropriability, high uncertainty, and rare character of transacting (high costs for negotiating, contracting, charging all potential consumers, disputing). At the same time, supply of additional environmental protection and improvement service is very costly (in terms of production and organization costs) and would unlikely be carried out on a voluntary basis. Besides, financial compensation of farmers by willing consumers through a pure market mode is also ineffective due to high information asymmetry, and massive enforcement costs. A third-party mode with a direct public involvement would make that transaction effective: on behalf of consumers State agency negotiates with individual farmers a contract for "environment conservation and improvement service", coordinates activities of various agents (including direct production management), provides public payments for compensation of farmers, and controls implementation of negotiated terms[15].

2.3. Improving modes of public intervention

There is a big variety of possible *forms for public intervention* in market and private activities. *Comparative* analysis is to extend to public modes and include:

[14] Unprecedented development of "codes of behaviors", eco-labeling and branding, environmental cooperatives, and "green alliances", all they are good examples.

[15] Public environmental contracts with individual farmers have been broadly used in EU as effective form for governing the supply of environmental preservation and improvement services [1].

First, assessing the correspondence of public involvement to the real needs of socio-economic development – identified needs for a third-party intervention from Figure 2.

Second, assessment of *comparative* advantages of alternative modes for public involvements comprising *all* costs – direct (tax payer, assistance agency) expenses, *and* transacting costs of bureaucracy (for coordination, stimulation, mismanagement), *and* costs for individuals' participation and usage of public modes (expenses for information, paper works, payments of fees, bribes), *and* costs for community control over and reorganization of bureaucracy (modernization and liquidation of public modes), *and* (opportunity) costs of public inaction.

Third, estimation of *comparative efficiency* of selected and other feasible modes of governance of socially desirable activity - partnership with private sector, property rights modernization etc. Accordingly, public intervention is to be initiated only if there is overall *net benefit* - when effects are greater than additional (individual and social) costs for the third-party involvement [14].

Depending on *uncertainty, frequency*, and necessity for *specific investment of public involvement,* there will be different most effective forms (Figure 3). Interventions with low uncertainty and assets specificity would require smaller Government organization (more regulatory modes; improvement of general laws and contract enforcement). When uncertainty and assets specificity of transactions increases a special contract mode would be necessary – employment of public contracts for provision of private services, public funding (subsidies) of private activities, temporary labor contract for carrying out special public programs, leasing out public assets for private management etc. When transactions are characterized with high assets specificity, uncertainty and frequency then internal mode and bigger public organization would be necessary – permanent public employment contracts, in-house integration of crucial assets in a specialized state agency or public company.

Level of Uncertainty, Frequency, and Assets specificity					
Low	←----------			----------→	***High***
New property rights	Public regulations	Public taxation	Public assistance	Public funding	Public provision

Figure 3. Principle modes for effective public intervention.

In the beginning, existing and emerging problems (difficulties, costs, risks, failures) in organization of market and private transactions have to be specified. The appropriate government involvement would be to create environment for: decreasing uncertainty surrounding market and private transactions, increasing intensity of exchange, protecting private rights and investments, making private investments less dependent etc. For instance, State establishes and enforces quality, safety and eco-standards for farm inputs and produces, certifies producers and users of natural resources, regulates employment relations, transfers water management rights to farms associations, sets up minimum farm-gate prices etc. All that facilitates and intensifies market and private transactions and enhance socio-economic growth of agriculture.

Next, practically possible modes for increasing appropriability of transactions have to be considered. Low appropriability is often caused by unspecified or badly specified

private rights [22]. In some cases, most effective government intervention would be to introduce and enforce *new private property rights* – rights for clean, beautiful environment, biodiversity; private rights on natural, biological, and environmental resources; private rights for (non) profit management of natural resources; private rights on intellectual agrarian property, origins, (protecting) eco-system services; rights on issuing eco-bonds and shares; tradable quotas (permits) for polluting; private liability for polluting etc. That would be efficient when privatization of resources or introduction (and enforcement) of new rights is not associated with significant costs (uncertainty, recurrence, and level of specific investment are low). Government intervention effectively transfers organization of transactions into market and private governance, liberalizes market competition and induces private incentives (investments) in certain activities (Figure 2).

In other instances, it would be efficient to put in place *public regulations* for production, trade, and utilization of resources and products – standards for labor (safety, social security), product quality, environmental performance, animal welfare, good farming practices; norms for using natural resources, introduction of foreign species and GM crops, and (water, soil, air, comfort) contamination; bans on application of certain chemicals or technologies; regulations for organic farming, biodiversity and landscape management, trading ecosystem service protection; certifications and licensing; mandatory eco-labeling and eco-training; foreign trade regimes etc.

In other cases, using incentives and restrictions of *tax system* would be the most effective form for intervention. Different sorts of tax preferences (exception, breaks, credits) are widely used to create favorable conditions for development of certain (sub)sectors, regions, forms of organization, segment of population, or types of activities. Environmental taxation on emissions, products (inputs, outputs) and wastes is also increasingly applied to change the eco-behavior of agents and reduce harmful impact. Likewise, tax or levies schemes on farming or export are employed for funding innovations and extension service etc.

Often providing *public assistance and support* to private organizations is the best form of intervention – recommendations, information, demonstrations, and training; mediation in farmland deals; assisting farmers and eco-associations; collecting fees for eco-system service providers etc.

Public *financial* support is broadly used instrument in developed and developing countries alike - preferential credits, subsidies and grants of production, marketing, environmental etc. actions of farmers, rural households, businesses, and community organizations. Agrarian and rural development programs are common and aim "proportional" development of agriculture, improvement of farmers welfare ("income parity"), poverty eradication in rural areas etc. Nevertheless, in most developed countries they brought about undesired effects such as over-intensification, environmental degradation, and market distortions.

In some instances *pure public organization* (in-house production, public provision) is the most effective as in the case of agrarian research, education and extension; agro-market and know-how information; agro-meteorological forecasts; sanitary and veterinary control, vaccination, and prevention measures; important agro-ecosystems and national parks; eco-monitoring and foresight; risk assessment etc.

Usually, specific modes are effective if they are applied alone with other modes of public intervention. Necessity of *combined* intervention (a *governance mix*) is caused by: complementarities (joint effect) of individual forms; restricted potential of some less expensive forms to achieve certain (but not entire) level of socially preferred

outcome; possibility to get extra benefits (e.g. "cross-compliance" requirement for public support); particularity of the problems to be tackled; specific critical dimensions of governed activity; uncertainty (little knowledge, experience) associated with likely impact of new forms; practical capability of Government to organize (administrative potential to control, implement) and fund (direct budget resources and/or international assistance) different modes; dominating policy doctrine [14].

Besides, *level* of effective public intervention (governance) depends on the kind of problem and scale of intervention. There are public involvements which are to be executed at *local* (ecosystem, community, regional) level, while others require *nationwide* governance. And finally, there are activities, which are to be initiated and coordinated at *international* (regional, European, worldwide) level due to strong necessity for trans-border actions (needs for cooperation in natural resource and environment management, exploration of economies of scale/scale, prevention of ecosystem and climate disturbances, governing of spill-overs) or consistent (national, local) *government failures*. Very frequently the effective governance of many problems (risks) requires *multilevel* governance with a system of combined actions at various levels involving diverse range of actors and geographical scales.

Public (regulatory, inspecting, provision) modes must have built special mechanisms for increasing *competency* (decrease bounded rationality and powerlessness) of bureaucrats, beneficiaries, interests groups and public at large as well as restricting possible *opportunism* (opportunity for cheating, interlinking, abuse of power, corruption) of public officers and other stakeholders. That could be made by training, introducing new assessment and communication technologies, increasing transparency (e.g. independent assessment and audit), and involving experts, beneficiaries, and interests groups in the management of public modes at all levels [14]. Furthermore, applying "market like" mechanisms (competition, auctions) in public projects design, selection and implementation would significantly increase incentives and decrease overall costs.

Principally, a *pure* public organization should be used as a *last resort* when all other modes do not work effectively [12]. "In-house" public organization has higher (direct and indirect) costs for setting up, running, controlling, reorganization, and liquidation. What is more, unlike market and private forms there is not automatic mechanism (such as competition) for sorting out less effective modes[16]. Here a *public "decision making"* is required which is associated with high costs and time, and it is often influenced by strong private interests (power of lobbying groups, policy makers and associates, employed bureaucrats) rather than efficiency. Along with development of general institutional environment ("The Rule of Law") and measurement, communication etc. technologies, efficiency of pro-market modes (regulation, information, recommendation) and contract forms would get bigger advantages over internal less flexible public arrangements [14].

Usually *hybrid modes* (public-private partnership) are much more efficient than pure public forms given coordination, incentives, and control advantages. In majority of cases, involvement of farmers, farmers organizations and other beneficiaries increases efficiency - decreases asymmetry of information, restricts opportunisms, increases incentives for private costs-sharing, and reduces management costs [14]. For instance, a hybrid mode would be appropriate for carrying out supply of non-food services by farmers such as preservation and improvement of environment, historical

[16] It is not rare to see highly inefficient but still "sustainable" public organizations around the world.

and cultural heritages. That is determined by farmers information superiority, strong interlinks of activity with traditional food production (economy of scope), high assets specificity to farm (farmers competence, high cite-specificity of investments to farm and land), and spatial interdependency (needs for cooperation of farmers at regional or wider scale), and not less important – farm's origin of negative externalities. Furthermore, enforcement of most labor, animal welfare, biodiversity etc. standards is often very difficult or impossible at all. In all these cases, stimulating and supporting (assisting, training, funding) private voluntary actions are much more effective then mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs [22].

Anyway, if there is strong need for a third-party public involvement but effective government intervention is not introduced in a due time, agrarian "development" would be substantially deformed. Government failure is not only possible but often prevails. In Bulgaria for instance, there has been a great number of bad examples for Government under- and over-interventions in agrarian sector during post-communist transition now [18]. Consequently, primitive and uncompetitive small-scale farming; predominance of over-integrated and personalized exchanges; ineffective and corrupted agrarian bureaucracy; blocking out all classes of agrarian transactions (innovation and extension supply, long-term credit supply, supply of infrastructure and environmental goods); development of a large informal (gray) sector, all they have come out as a result.

2.4. Steps in analyses and improvement of governance

The analysis and improvement of the governance of socio-economic dynamic of agriculture has to go though following major steps:

Firstly, assessment is to be made on *economic, social, environmental* etc. sustainability of different agricultural systems (farm, eco-system, regional, national etc.), and *existing* and *emerging* problems and risks in agrarian development identified (Figure 4). There are worked out and widely used a great number of holistic systems for assessing sustainability levels and socio-economic dynamics of divers agricultural systems [6, 27].

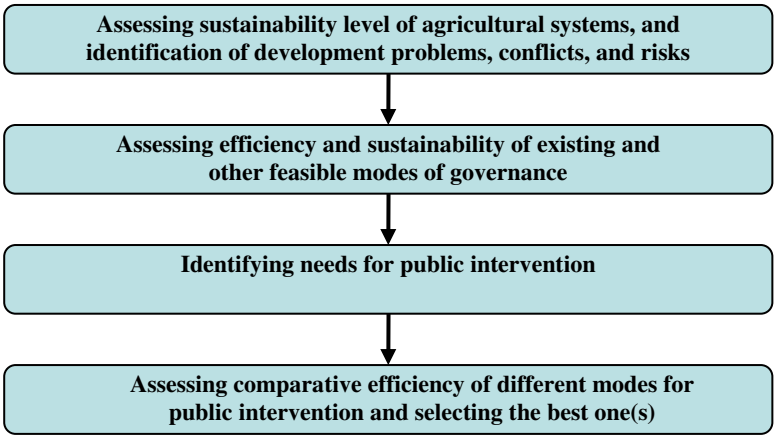

Figure 4. Steps in analysis and improvement of governance of socio-economic dynamics of agriculture.

Identified problems of development could be internal for a particular agricultural system or caused by other or larger systems[17]. In any case, *persistence* of serious social, economic and environmental challenges (problems, conflicts, risks) is a credible indicator that effective system of governance is not put in place. Modern science offers quite precise methods to *detect* various (social, economical, ecological) problems and risks associated with agrarian development. Simultaneously it provides methods to *improve farming systems* in order to mitigate socio-economic and environmental hazards caused by agriculture and other (man-made or natural) factors.

Secondly, spectrum of existing and other *practically possible* modes of governance (institutions; market, private, public and hybrid forms) employed in agriculture has to be *identified*, and their efficiency *and* sustainability *assessed*. Evaluation of efficiency of individual modes will show their *ability (potential) to deal with various challenges of and contribute to* agrarian development at different levels. In addition, assessment of sustainability of existing governing structure is necessary to get idea about its "internal" potential to adapt (evolve, modernize, transform) to dynamic economic, institutional and natural environment, and meet effectively *new (future) challenges* and goals of socio-economical development[18]. All these would let us know *whether* (and *extend* to which) there will be efficient response to development objectives and challenges *within existing system* of governance.

Third, serious *deficiencies* (failures) in dominating market, private, and public modes to solve existing and emerging problems (risks, goals) of agrarian socio-economic development are to be specified, and the *needs for a (new) public intervention* identified. That step is to include analysis of *structure* and *factors* of transaction costs at *local, nationwide and international scale*, which eventually slow down sustainable growth of agrarian sector and different regions, and lead to insufficient and unsustainable use of resources, underinvestment and low productivity

[17] In globalise economy many of factors affecting agrarian development are *external* for agriculture – food demand, progress in science and technologies, global warning, global financial and economic crisis, regional water crisis etc.

18 Some governing modes are highly efficient in "current" economic, social and natural environment but unable to adapt (sustain) to evolving new (future) challenges of socio-economic development.

in production, lack of innovations, holdup of social cohesion of agrarian and rural actors etc.

Finally, alternative modes for public intervention to *correct* existing market, private sector and public sector failures have to be identified; and their *comparative efficiency* assessed in terms of contribution to socio-economic dynamics and minimization of total social costs; and the *most efficient* one(s) *selected.*

It is essential to assess *comparative* efficiency of *practically* (technically, socially) *possible* and *alternative* forms of governance. Thus, additional benefits (problems to be solved, risks to be overcome, new goals to be achieved), *and* costs, *and* modes for a new public intervention must be *socially admissible* (acceptable). If different forms permit achieving the *same goals*, tackling the *same problems*, overcoming the *same risks* etc., analysis is to focus on selection of the mode *minimizing the total* (implementing *and* transacting) *costs.*

Moreover, a form having the same (or less) costs as the alternatives is to be chosen if it provides more benefits or it is (socially, politically, technically) more *preferable* than other arrangements. If one of possible forms provides *more benefits at the expense of more costs*, then the selection is to be made depending on whether the *additional costs for that public intervention are socially acceptable* (and feasible) or not. Similarly, if there is a *single* (only one) mode available for governing a particular intervention (achieving a certain development goal) it would be introduced only if associated implementing *and* transacting costs are socially *admissible* (and feasible).

At this final stage, our comparative analysis let us *improve the design* of new forms of public intervention according to the *specific* market, institutional and natural *environment* of a particular country, region, sub-sector[19], and in terms of perfection of coordination, adaptation, information, stimulation, restriction of opportunism, controlling of participating actors (decision-makers, implementers, beneficiaries, other stakeholders).

What is more, it also unable us to *predict* likely cases of *new* public (local, national, international) *failures* due to impossibility to mobilize sufficient political support and necessary resources and/or ineffective implementation of otherwise "good" policies in the specific economic, institutional and natural environment of a particular country, region, sub-sector etc. Since public failure is a feasible option its timely detection permits foreseeing the persistence or rising of certain problems of agrarian development, and *informing* (local, international) community about associated risks.

3. Conclusion

Deepening labor specialization and cooperation, and exchanges between agents opens up enormous opportunities for socio-economic growth of agriculture. However, it is also associated with significant transaction costs which might disturb sustainable development. In the traditional (Neoclassical Economics) framework with no transacting costs there is only one mechanism for governing relations between individuals and agrarian development. "Free market prices" (and market competition) effectively coordinate and stimulate the entire activity of resource owners, entrepreneurs, and consumers. Rare cases of market "failures" are also recognized

[19] Effective institutions can not be "imported" but must be designed for the specific conditions of different countries, regions, sectors etc. [15].

("negative externalities", "tragedy of commons") but a perfect "government intervention" is seen as a remedy. All that leads to an interrupted global socio-economic development (maximum growth in productivity, welfare, and environmental conservation).

In the real economy, there are additional important factors affecting individual choices and socio-economic dynamics (namely institutions and transacting costs), and a great variety of effective governing mechanisms. The institutional environment is a crucial factor, which eventually determines the type and pace of development. Depending on personal characteristics of agents and critical attributes of each activity, there will be a spectrum of effective structure for organization of agrarian resources, activities and exchanges – some will be governed by "invisible market hand", other by special contract forms, some by "visible manager hands" or within complex hierarchies, other will be supported by a third-party etc. Accordingly, individual agents will introduce new initiatives, compete on market place, contract private arrangements, cooperate with others to take advantage of market, technological, institutional and natural opportunities (and restrictions) and achieve their particular goals.

Our new framework helps better understand the "Government's role" in socio-economic dynamics as well. Agrarian agents deal with market deficiency developing different non-market forms for effective governance (contracts, internal modes, collective actions etc.). Nonetheless, private sector also "fails" to safeguard individual rights and carry out certain activities at effective scale. That is particularly true for human and eco-rights, technological and infrastructural development, management of non-renewable resources, environmental conservation activity etc. Thus there is a strong need for a third-party public involvement in market and private transactions though institutional modernization, assistance, regulation, hybrid or public organization. Diverse forms of public interventions are with unequal efficiency and the most efficient one is to be selected taking into account overall transaction costs and contribution to sustainable development. What is more, at present stage most public interventions increasingly require concerted actions (multilateral and multilevel governance) at local, regional, national, transnational, and global scale. Nevertheless, "government failure" is also possible, and inappropriate involvements, under or over-regulations, mismanagement, corruption etc. are widespread around the world.

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